

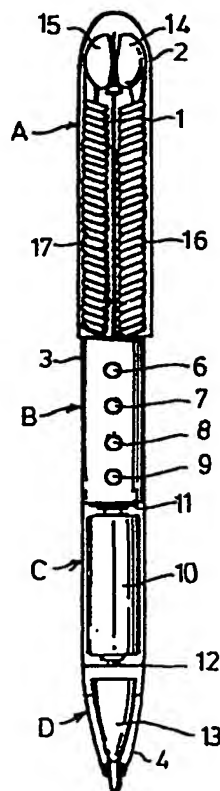


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/NL98/00276 (22) International Filing Date: 15 May 1998 (15.05.98) (30) Priority Data: 1006076 16 May 1997 (16.05.97) NL (71)(72) Applicant and Inventor: COUPRIE, Dirk, Jacob, Jan [NL/FI]; Kunnalliskodintie 6 E 102, FIN-00600 Helsinki (FI). (74) Agent: DE HOOP, Eric; Octrooibureau Vriesendorp & Gaade, P.O. Box 266, NL-2501 AW The Hague (NL).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>In English translation (filed in Dutch).</i>

(54) Title: PEN-RADIO RECEIVER**(57) Abstract**

Pen-radio comprising a pen-shaped envelope with an upper and lower end, a radio portion and a battery portion being accommodated in said pen-shaped envelope, and an antenna, the radio portion having connections for earphones, characterized in that the pen-radio comprises earphones and a pen portion placed at the lower end, and that the pen-shaped envelope comprises a storage portion for the earphones near the upper end, in which the earphones can be taken from, be stored in, respectively, the storage portion and be connected to the connections through connecting cords.



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PEN RADIO RECEIVER

The present invention relates to a pen-radio comprising a pen-shaped envelope with an upper end and a lower end, a radio portion and a battery portion being accommodated in said pen-shaped envelope, and an antenna, the radio portion having connections for earphones.

Such a pen-radio is known from the International patent application WO 83/03503. This pen-radio has an audio output socket connection at the lower portion of the pen-shaped envelope to which separate earphones can be connected. A disadvantage of this pen-radio is that the separate earphones take a lot of extra storage space, may get mislaid and that the connecting cords of the earphones may get tangled so that connection to the pen-radio unnecessarily takes up time. A further disadvantage of this known pen-radio is that it cannot function as a pen.

It is an objective of the present invention to provide a pen-radio without the disadvantages of the known pen-radio.

To that end a pen-radio of the kind mentioned in the preamble according to the invention is characterized in that the pen-radio comprises earphones and a pen portion placed at the lower end, and that the pen-shaped envelope comprises a storage portion for the earphones near the upper end, in which the earphones can be taken from, be stored in, respectively, the storage portion and are connected to the connections through connecting cords. By integrating the earphones in the pen-radio a substantial saving of space is obtained and the pen-radio can be made ready for use in a simple way. By accommodating a pen portion the pen-radio also functions as writing pen.

- 2 -

From WO 96/04620 a multi-functional portable pen-shaped communication device is known with a pen portion in which however a loud speaker is fixedly connected to the pen-shaped envelope. The pen-shaped device with loud speaker
5 then always has to be brought to one of the ears for a good audibility which is user-unfriendly. Moreover, it is not possible to give a stereo reproduction with this known communication device.

10 Further preferred embodiments of a pen-radio according to the invention are described in the sub-claims.

Some embodiments of a pen-radio according to the invention will be described after this by way of example on the
15 basis of the drawing in which

figure 1 shows a schematical cross-section of a first embodiment of the pen-radio according to the invention,

20 figure 2, 3 and 4 show further embodiments of a pen-radio according to the invention with envelope portions which can be folded away hingewise,

figure 5 shows a cross-section of a connecting cord with
25 integrated antenna for a pen-radio according to the invention,

figures 6, 7 and 8 show views from above of ways of
30 storing connecting cord of the pen-radio according to the invention,

figures 9a and 9b schematically show two ways of using the inventive pen-radio,

35 figure 10 schematically shows the cords in stored state of the pen-radio,

- 3 -

figure 11 shows a schematical front view, partly cut-away, of an alternative embodiment of a pen-radio according to the invention in closed state,

5 figure 12 shows a schematic front view, partly cut-away, of the alternative embodiment of figure 11 in opened state,

figure 13 shows a schematic side view of figure 12,

10

figure 14 shows a schematic front view, partly cut-away, of another alternative embodiment of a pen-radio according to the invention in closed state,

15 figure 15 shows a schematical front view, partly cut-away, of another alternative embodiment of figure 14 in opened state,

20 figure 16 shows a schematic side view of figure 15 with the earphones taken out,

figure 17 shows a schematic front view, partly cut-away, of a further alternative embodiment of a pen-radio according to the invention in closed state,

25

figure 18 shows a schematic front view of the pen-radio of figure 17 in opened state,

30 figure 19 shows a schematic side view of the pen-radio of figure 18,

figure 20 shows a schematic side view of the pen-radio of figure 19 with the earphones taken out,

35 figure 21 shows a cross-section along line XXI-XXI of figure 17, without earphones,

- 4 -

figure 22 shows a view of the device for rolling up the connecting cords to be used in the embodiment of the pen-radio according to figures 17-20, and

5 figure 23 and figure 24 show a detail of figure 22.

In figure 1 a pen-radio according to the invention is shown schematically in cross-section. The pen-radio comprises a pen-shaped envelope 3 with an upper end 2 and
10 a lower end 4. In the pen-shaped envelope 3 near the upper end 2 a storage portion A for earphones 14, 15 is accommodated as well as a radio portion B with operating buttons 6, 7, 8 and 9 for the radio, a battery portion C and a pen portion D placed near the lower end 4. The earphones
15 14, 15 are connected to the radio portion B by the connecting cords 16, 17, respectively. Furthermore the pen-radio has a indicator lamp 5, for instance a red LED, which for instance may be integrated in the clip of the pen-radio (see figure 2) to indicate that the radio is in use. In
20 this way it is prevented that the radio is kept playing unnoticeably and thus the battery is running down unnoticeably.

In order to be able to take out the earphones from the
25 envelope in a simple way, preferably a portion of the pen-shaped envelope near the storage portion A can be folded away hingewise, as is shown in various embodiments in figures 2, 3 and 4. To make it possible for the hingewise portion to be folded away for instance first a button for
30 unlocking 18 has to be pushed in.

In the storage portion a little spring-activated bar 1 (figure 1) can be accommodated, which has the earphones spring out of the pen-radio when the hingewise portion is
35 folded away. The earphones then partially protrude and can easily be engaged and pulled out of the storage portion A.

- 5 -

In the embodiment of figure 1 the earphones have separate connecting cords. Preferably the connecting cords are joined (figure 9 and 10) over a length from the connections, because of which the storing and the use of the pen-radio is made easier.

When a groove 21 (figures 3 and 4) is arranged in the portion of the envelope which is situated adjacent to the portion of the pen-shaped envelope that can be folded away (figure 2), or in the portion that can be folded away itself, the connecting cords can be laid in the groove 21 after the earphones have been taken out of the storage portion, after which the portion that can be folded away can be closed again. This provides among others a better protection of the connecting cords, particularly their attachment to the connections, as with a closed envelope the cords cannot easily be torn loose.

In order to facilitate the storing away again of the earphone the storage portion A preferably comprises a partition wall 19 (figures 3, 4 6 and 7), which is preferably integrated in the portion that can be folded away.

In the example shown the connecting cords are spiral shaped and have for instance a rectangular cross-section of 1mm by 1.5mm, as shown in figure 5, because of which as large as possible a length of cord of possibly even up to 90cm can be obtained with as small as possible a storage space.

In order to improve the reception of the radio portion the antenna 20 preferably is integrated in the connecting cords.

The shape of the cords as seen from above is oval in case the cords are separated (figure 6). A partition wall then

- 6 -

may be placed in the storage portion, so that each cord has its own space and does not come into contact with the other, which facilitates the storing. If a little spring-activated bar 1 is accommodated in the middle of the storage portion, the form of the cords may look like as is shown in figure 7. A partition wall may also be there.

At a partial joining of the cords in the beginning (see figure 9 in state of use and figure 10 in stored away state of the radio) the cords are laid next to one another to be space saving in that way and to guarantee a long length of cord per winding (at a 1mm thickness). The outer cord will then have a length of about 3cm per winding, and the inner cord a length of about 2.5cm. In this design there is no room for a partition wall, there is however room for the little bar 1 (figure 8).

As radio receivers are generally known no further description will be given of the electric components in the radio portion B (figure 1). The operating buttons 6, 7, 8 and 9 may vary in number and location, in which the pen-radio preferably is provided with a auto-tuning-device so that only small key buttons and no slide or turn buttons are needed for tuning into a channel.

In the battery portion C a battery 10 is accommodated which feeds the radio portion B via the contacts 11 and 12 in the known manner.

In the pen portion D a filling 13 is accommodated so that the pen-radio can also function as writing pen, in which the tip of the filling 13 can be turned in and out of the pen-radio in the known manner.

In figures 11, 12 and 13 an alternative embodiment of a pen-radio according to the invention is shown, which differs from the one in figure 1 because no portion of the

- 7 -

pen-shaped envelope that can be folded away, is present. In this alternative embodiment the earphones are pushed out of the pen-shaped envelope after operating an device to unlock by spring-force activated by a spring 22 and thus can be removed and placed more easily. In order to ensure that the earphones remain in contact with the radio portion, guiding rails 22 are provided with which the ends of the earphones remain in contact. The earphone portion does not need to be slid back while listening to the radio. In stored-away state, the earphones rest in a fitting container 24 which is situated on a rod. Said rod is shaped such that both earphones can be taken out simultaneously by thumb and index finger. In the top of the pen is a hole 25, through which the connecting cords can come out when the earphone portion is in slid-back position during listening to the radio. The pen-radio can also be designed without a spring. The earphone portion can then be slid out manually.

In figures 14, 15 and 16 another alternative embodiment of the pen-radio according to the invention is shown, in which the upper end 28 of the pen-shaped envelope is slid downwards over the radio portion, because of which the earphone become visible and easy to reach. In this embodiment the non-spiral-shaped connecting cords are manually unwound and after use rolled up again. At the upper end 28 also a lever which can be folded out could be arranged, because of which when rotating it the phone cords would be wound about the rotating bar 29 and are thus rolled up. In this case the bar 29 rotates freely from the rest of the pen or the upper end 28 can rotate freely about the pen. When the upper end that is slid downwards is held by the one hand, the earphones can be pulled away from the pen by the other hand. In order to store the earphones again after use, the battery portion can be rotated by the other hand. The bar 29 of the earphone portion then also rotates and in that way the ear-

- 8 -

phones are rolled up. To have the connecting cords rolled up in an orderly manner, addition of a spiral-shaped bar 34 as applied in figures 17, 18, 19 and 20 could be thought of.

5

Because the upper end is slid over the radio portion, the operating buttons 26 may not protrude. In this embodiment they are therefore arranged in the pen in a recessed way. The connecting cords can also be partly joined and split, up in two only halfway. In the upper end 28 there is a hole 27 through which the connecting cords extend when at use of the radio the upper end 28 is in slid-back position again.

15 In the figures 17, 18, 19 and 20 a further alternative embodiment is shown of a pen-radio which differs of the one shown in figures 14, 15 and 16, in that in this embodiment use is made of automatic system for rolling up based on the system for rolling up in most vacuum
20 cleaners. After sliding down the upper end the earphones with connecting cords can be pulled out. After use of the radio and a press on the brake button 30 the earphones automatically roll up. The bar 33 in the earphone portion has a spiral shape 34. This shape guides the connecting
25 cords 31 so that they do not get tangled at rolling up or roll up double and thus get stuck.

Figure 21 is a cross-section along line XXI-XXI of figure 17, and shows the container of the earphones. Because of
30 this shape the earphones can easily be picked from the bar 33 by hand (between thumb and index finger).

In figure 22 the system for rolling up is shown in blown-up form. The spiral shaped tube 35 rotates about an axis
35 36 and is driven by a spring 37 which at the one end is connected to the axis 36 and on the other end to the container with the system for rolling up 19. Two clamps 40

- 9 -

are constantly in contact with two circular rails 41, because of which the power cannot be broken off. Figure 23 gives a better view of the working of the clamps 40 and the rails 41. Figure 24 is picture of the view from above
5 of the spring 37 shown in figure 22.

- 10 -

Claims

1. Pen-radio comprising a pen-shaped envelope with an upper and lower end, a radio portion and a battery portion being accommodated in said pen-shaped envelope, and an antenna, the radio portion having connections for ear-
5 phones, **characterized in that** the pen-radio comprises earphones and a pen portion placed at the lower end, and that the pen-shaped envelope comprises a storage portion for the earphones near the upper end, in which the ear-
10 phones can be taken from, be stored in, respectively, the storage portion and be connected to the connections through connecting cords.
2. Pen-radio according to claim 1, **characterized in that** near the storage portion a portion of the pen-shaped
15 envelope can be folded away hingewise, is slideable or extendible.
3. Pen-radio according to claim 2, **characterized in that** a groove is arranged in the portion of the envelope which is
20 situated adjacent to the portion of the pen-shaped envelope that can be folded away, in the portion that can be folded away itself, respectively.
4. Pen-radio according to claim 2 or 3, **characterized in**
25 **that** a little spring activated bar is accommodated in the storage portion.
5. Pen-radio according to claim 1, 2, 3 or 4, **characterized in that**, the earphones have connecting cords which are joined over a length from the connections.
- 5 6. Pen-radio according to any one of the preceding claims,

- 11 -

characterized in that the storage portion has a partition wall.

7. Pen-radio according to any one of the preceding claims,
5 characterized in that the antenna is integrated in the connecting cords.

8. Pen-radio according to any one of the preceding claims,
characterized in that a use indication lamp is integrated
10 in the clip of the pen-radio.

9. Pen-radio according to any one of the preceding claims,
characterized in that the pen-radio is provided with a system for rolling up the connecting cords.

15 10. Pen-radio according to claim 4, characterized in that the little bar is spiral shaped.

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1/7

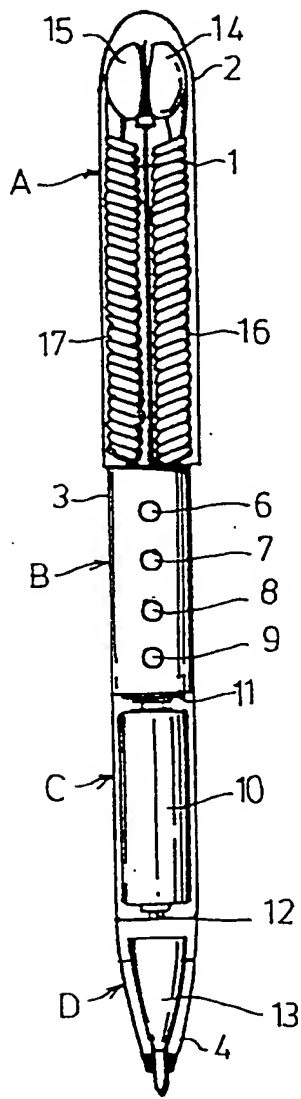


FIG. 1

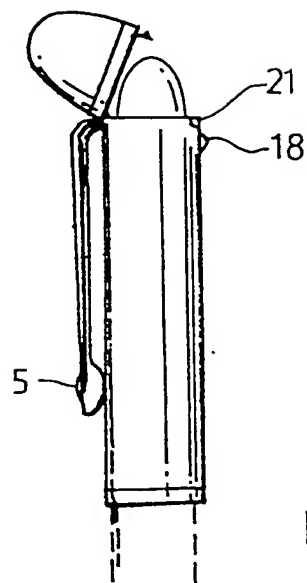


FIG. 2

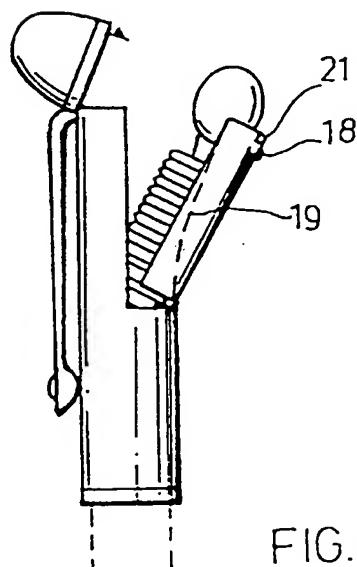


FIG. 3

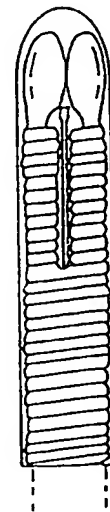
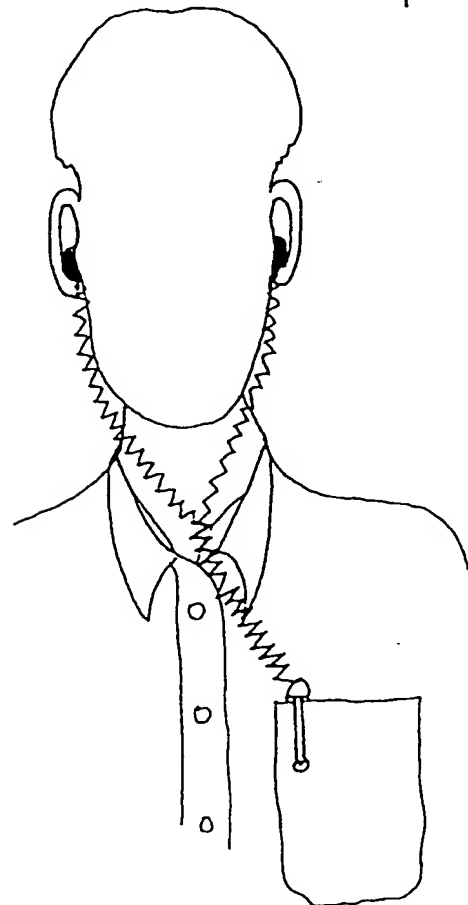
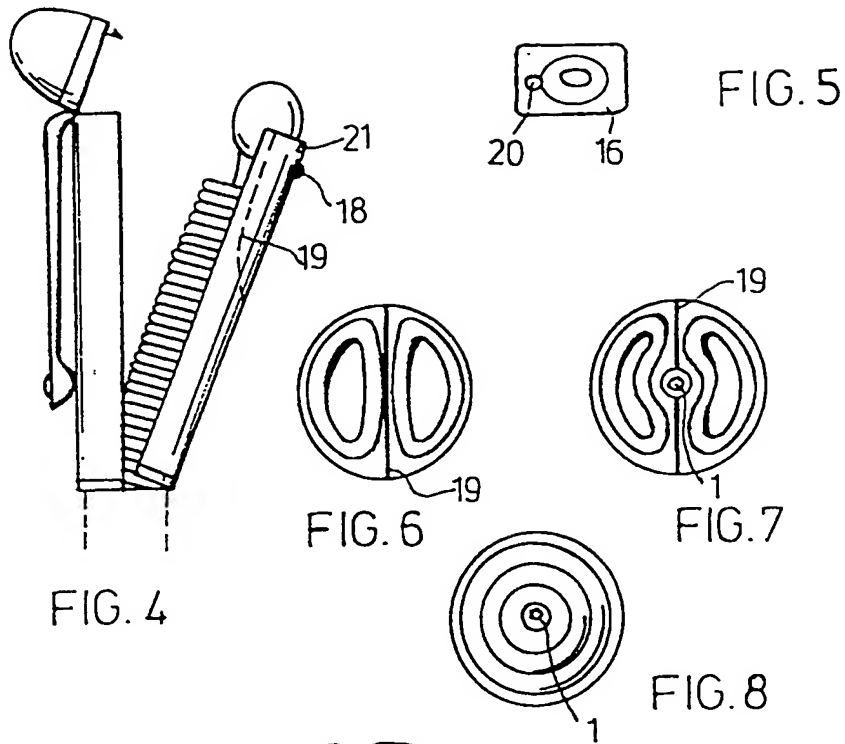


FIG. 10

FIG. 9a

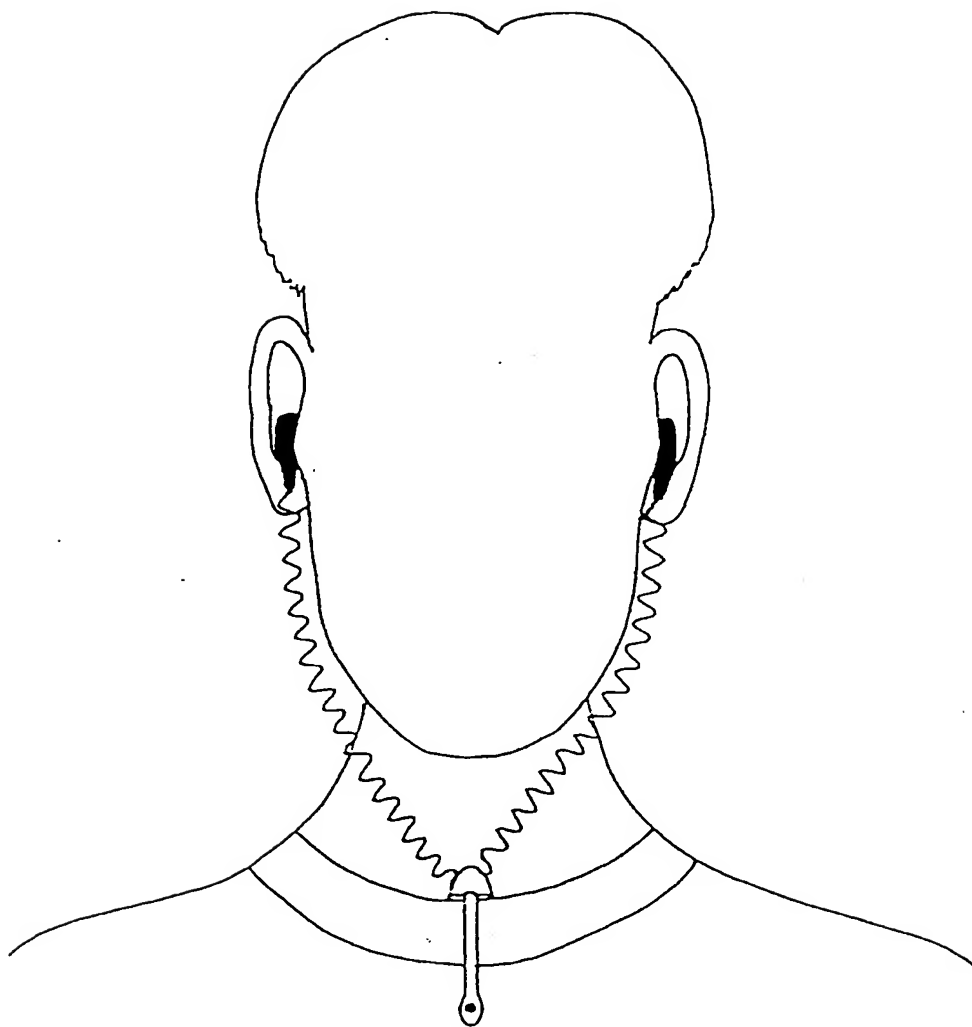


FIG. 9b

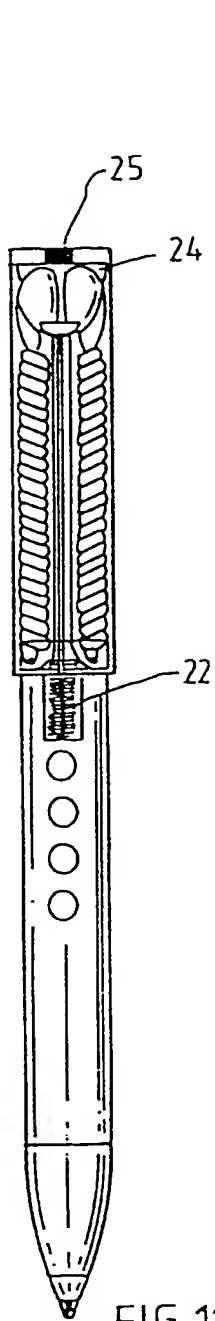


FIG. 11

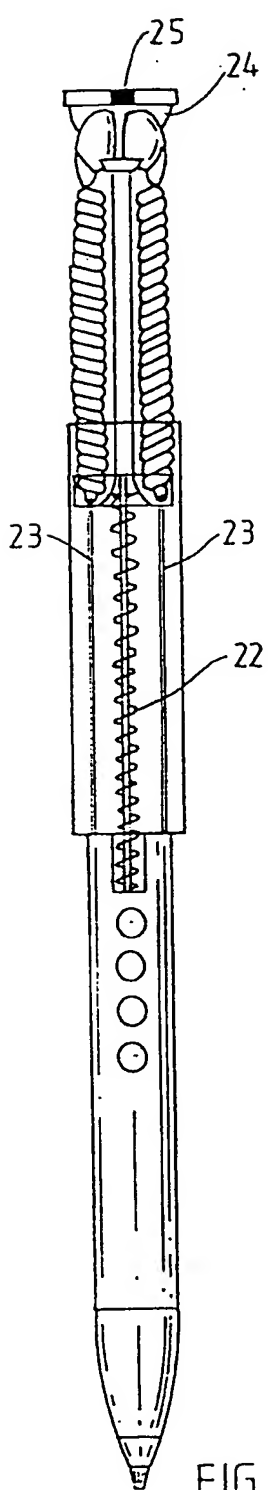


FIG. 12

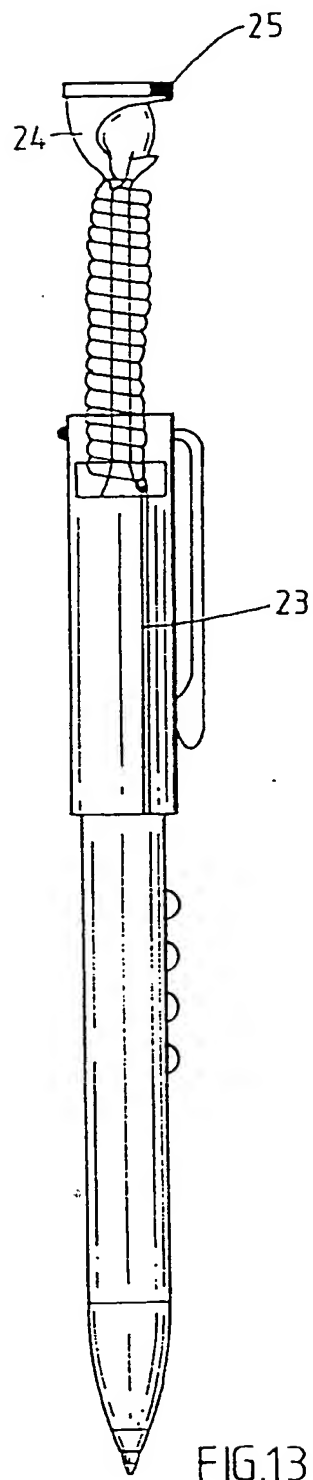


FIG. 13

5/7

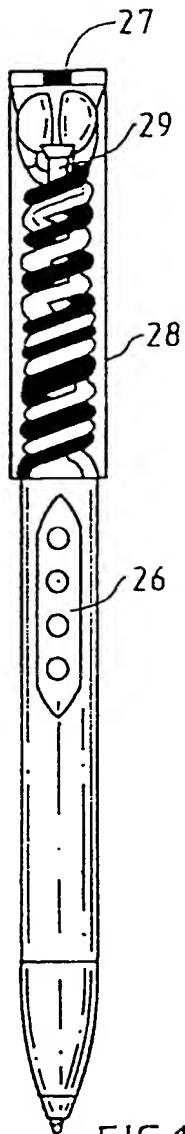


FIG. 14

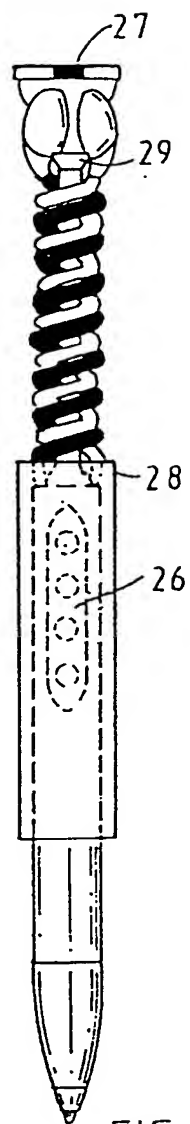


FIG. 15

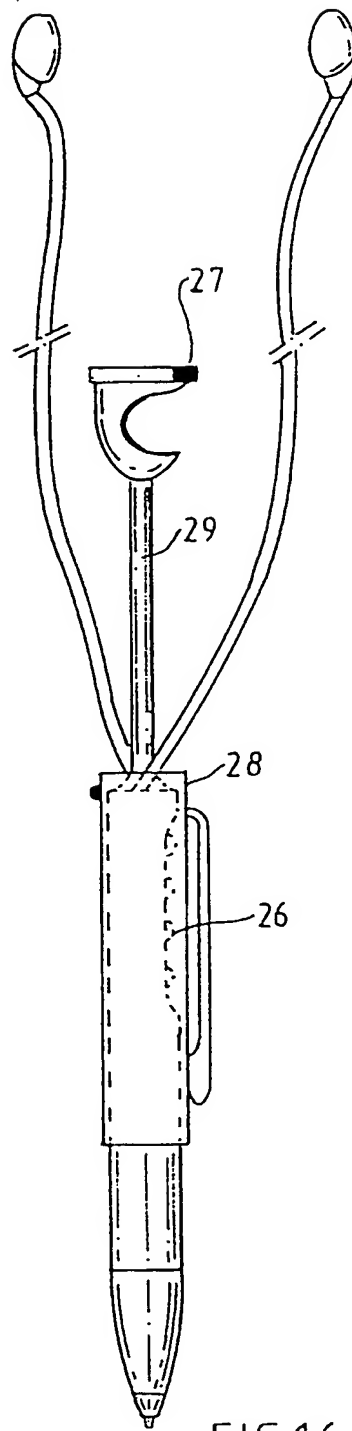
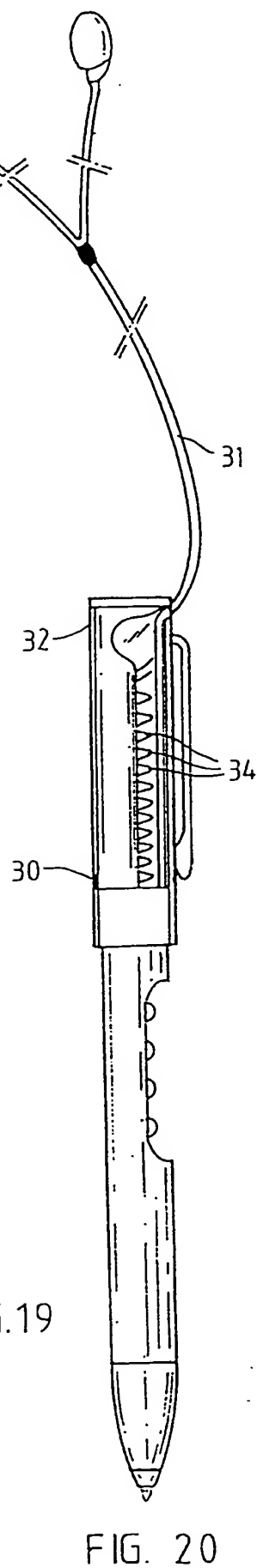
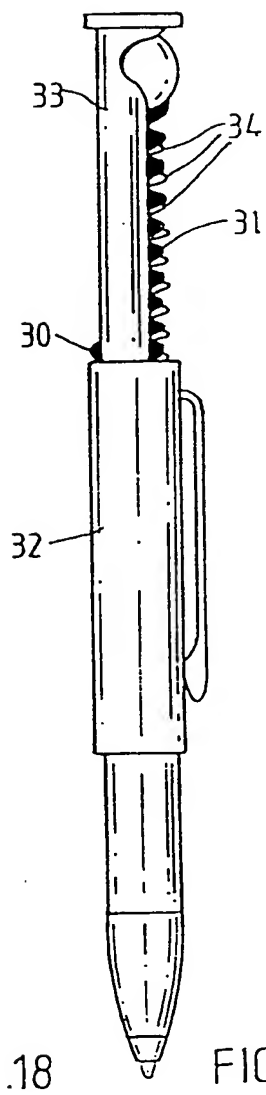
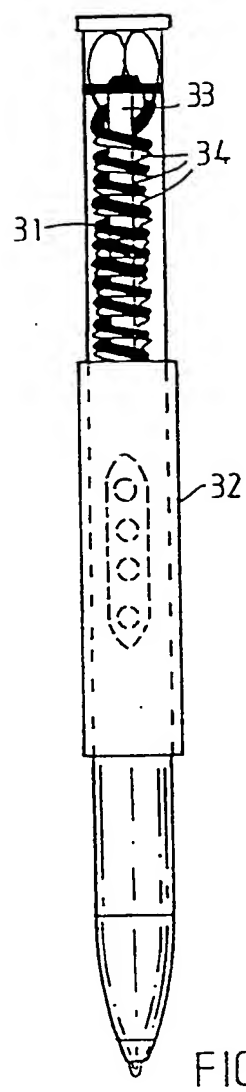
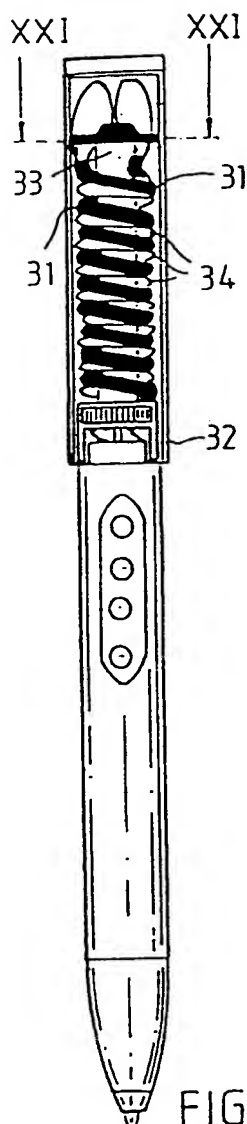


FIG. 16

6/7



7/7

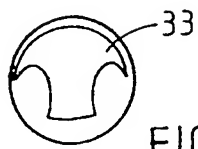


FIG. 21

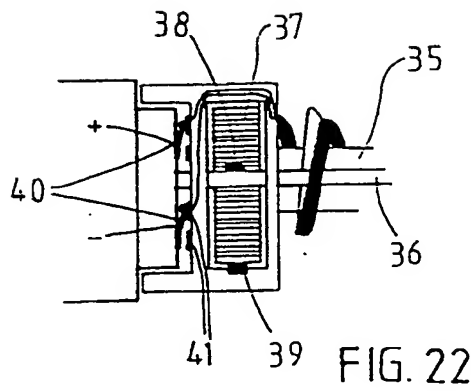


FIG. 22

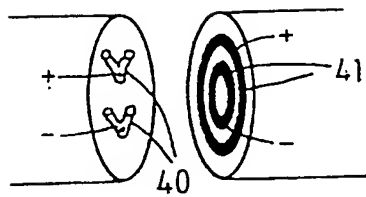


FIG. 23

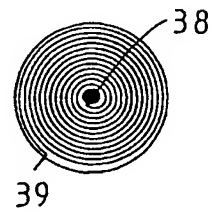


FIG. 24

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 98/00276

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04B1/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04B H04M H04R H05K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 83 03503 A (NORRIS ELWOOD G) 13 October 1983 cited in the application see abstract see page 3, line 24 - page 5, line 34 see figure 1 ---	1.5
A	US 5 339 461 A (LUPLOW HARLEY M) 16 August 1994 see abstract see column 2, line 33 - column 3, line 9 see column 4, line 53 - column 7, line 12 see figure 1 see figure 2 ---	1.5, 9
A	EP 0 374 473 A (GRUNDIG EMV) 27 June 1990 see the whole document ---	1.5, 9
-/--		



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Patent family members are listed in annex.

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Date of the actual completion of the international search

28 August 1998

Date of mailing of the international search report

04/09/1998

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 32 40 583 A (ZERBST EKKEHARD PROF DR) 3 May 1984 see the whole document ---	1,2
A	WO 96 04620 A (MICROBELL TECHNOLOGIES INC :MADMONY AVICHAH (US); THORPE ROGER T () 15 February 1996 cited in the application see abstract see page 7, line 8 - page 9, line 9 see figure 1 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/NL 98/00276

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
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WO 9604620	A	15-02-1996	AU 3237095	A	04-03-1996